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EXAMINER	
PATEL, HETUL B	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/733,553	LAM ET AL.	
	Examiner	Art Unit	
	HETUL PATEL	2186	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *03* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 October 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4 and 10-45* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 10-45* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the claim amendment and remarks filed on October 27, 2008. Claims 1, 5, 10, 29, 32, 38, 42 and 45 are amended; and none of the claims are cancelled or newly added. Therefore, claims 1-5 and 10-45 are currently pending in this application.

2. All previously outstanding objections and/or rejections to the Applicant's disclosure and/or claims not contained in this office action have been respectfully withdrawn by the Examiner hereto.

3. Applicant's arguments filed on October 27, 2008 with respect to the 112 rejection have been considered and they are persuasive, hence the prior 112 rejection has been withdrawn and this office action is made non-final.

4. Applicant's arguments filed on October 27, 2008 with respect to 103 rejection(s) in view of the amended claims have been considered but they are not persuasive.

5. The 103 rejection(s) of claims 1-5 and 10-45 as in the previous Office Action is respectfully maintained but updated to show the changes made by the amendment.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-2, 10-11, 13, 26, 28-29, 31-32, 34-35 and 37-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klein (USPN: 5,873,101) in view of Polfer at el. (USPN: 6,665,779) hereinafter, Polfer.

As per claim 1, Klein teaches a method for replicating data from a storage device (i.e. 200 in Fig. 2), comprising identifying one or more data blocks (i.e. the data blocks 215 in Fig. 2) comprising file data (i.e. blocks which contain meaningful information; according to the spec of the current application, any data block(s) containing any kind of data in it are considered as data blocks having valid data) stored in at least one first memory location on a storage device (i.e. 200 in Fig. 2) (e.g. see Col. 6, lines 45-50 and Fig. 2). The further steps of reading and recording is inherently taught by the Klein because in order to determine whether the data block contains the meaningful information or not, the particular block needs to be read (i.e. I/O access by performing a read operation) first and to determine whether data exist (i.e. to identify whether it comprise the file data or not) in it or not and then each block get backed up by copying it to the storage medium 250, i.e. read, i.e. I/O access is performed (e.g. see Col. 6, lines 45-53 and Figs. 2 and 8A). Klevin further teaches about identifying, based on the recorded I/O access information (i.e. based on the recorded flags which are generated by performing at least one read (I/O access) operation), one or more data blocks on the storage device that contain valid data; and replicating the data blocks that contain valid data by copying only the data blocks that were accessed during the at least one read operation (e.g. see Col. 6, lines 45-53 and Figs. 2 and 8A).

However, Klein does not teach about performing "read operation" in a "first memory location" that is different from a "second memory location" where the I/O accesses are recorded. Polfer, on the other hand, teaches about generating block map to indicate whether each of the data blocks in the partition contain valid data (i.e. the data blocks are read from the partition that is different from the block map where the validity flags/I/O accesses are recorded) (see the abstract). Accordingly, it would have been obvious to one of ordinary skills in the art at the time of the current invention was made to record the I/O accesses in a memory location that is different from the memory location where the data blocks are read from in the Klein's method as taught by Polfer so a single list (i.e. the block map) of all valid data blocks of the storage device can be created and based on that the back up/replication process can be started.

As per claim 2, the combination of Klein and Polfer teaches the claimed invention as described above and furthermore, Klein teaches that the at least one read operation includes reading metadata (i.e. extent map info stored in 216 in Fig. 2) associated with one or more files (i.e. data blocks) on the storage device (e.g. see Col. 6, lines 45-53).

As per claims 10 and 11, see arguments with respect to the rejection of claims 1-2, respectively. Claims 10 and 11 are also rejected based on the same rationale as the rejection of claims 1-2, respectively.

As per claims 26, 29 and 32, see arguments with respect to the rejection of claims 1-2. Claims 26, 29 and 32 are also rejected based on the same rationale as the rejection of claims 1-2.

As per claim 13, the combination of Klein and Polfer teaches the claimed invention as described above and furthermore, Klein teaches that a computer (i.e. 100 in Fig. 1) associated with the storage device (e.g. see Col. 3, lines 23-41).

As per claim 28, 31 and 34, the combination of Klein and Polfer teaches the claimed invention as described above and furthermore, Klein teaches that the list and the replicated data blocks are stored in a memory (i.e. a storage medium 250 in Fig. 2) (e.g. see Col. 6, lines 49-53 and Fig. 2).

As per claim 35, see arguments with respect to the rejection of claim 1. Claim 35 is also rejected based on the same rationale as the rejection of claim 1.

As per claim 37, the combination of Klein and Polfer teaches the claimed invention as described above and furthermore, Klein teaches that the at least one processor comprises: a first and a second software program (i.e. programs stored on 106 and 107 in Fig. 1) operating on the computer (e.g. see Fig. 1).

As per claims 38 and 39, Klein teaches a method of replicating data from a storage device (i.e. 200 in Fig. 2), comprising: receiving a message to replicate data stored on a storage device (inherent feature; since some kind of message/signal has to come either from the processor or the user to initiate the backup process); in response to the message, identifying on the storage device at least one data block comprising file data (i.e. meaningful data). The further step of performing is inherently taught by Klein because the particular block needs to be read (i.e. I/O access by performing a read operation) first and to determine whether data exist (i.e. to identify whether it comprise the file data or not) in it or not and then each block get backed up/replicated by copying

it to the storage medium 250, i.e. read, i.e. I/O access is performed, by copying only the data blocks that were accessed during the at least one read operation (e.g. see Col. 6, lines 45-53 and Figs. 2 and 8A).

However, Klein does not teach about performing "read operation" in a "first memory location" that is different from a "second memory location" where the I/O accesses are recorded. Polfer, on the other hand, teaches about generating block map to indicate whether each of the data blocks in the partition contain valid data (i.e. the data blocks are read from the partition that is different from the block map where the validity flags/I/O accesses are recorded) (see the abstract). Accordingly, it would have been obvious to one of ordinary skills in the art at the time of the current invention was made to record the I/O accesses in a memory location that is different from the memory location where the data blocks are read from in the Klein's method as taught by Polfer so a single list (i.e. the block map) of all valid data blocks of the storage device can be created and based on that the back up/replication process can be started.

As per claims 40-41, the combination of Klein and Polfer teaches the claimed invention as described above and furthermore, Klein teaches that receiving message(s) for initiating and ending the recording of I/O accesses performed by the storage device, i.e. by starting and ending the back-up process of data from the storage device (e.g. see abstract).

As per claim 42, see arguments with respect to the rejection of claims 38-41. Claim 42 is also rejected based on the same rationale as the rejection of claims 38-41.

As per claims 43-44, the combination of Klein and Polfer teaches the claimed invention as described above. The further step of identifying is inherently taught by the Klein because in order to determine whether the data block contains the meaningful information or not, the particular block needs to be read (i.e. I/O access by performing a read operation) first and to determine whether data exist (i.e. to identify whether it comprise the file data or not) in it or not and then each block get backed up by copying it to the storage medium 250, i.e. read, i.e. I/O access is performed (e.g. see Col. 6, lines 45-53 and Figs. 2 and 8A). Furthermore, the data block has to be referenced in the file system associated with the storage device in order to get it identified and read. Therefore, claims 43 and 44 are inherently taught by Klein.

7. Claims 18, 20 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klein in view of Polfer, further in view of Blumenau (USPN: 5,875,478).

As per claim 18, the combination of Klein and Polfer discloses the claimed invention as described above in rejection of claim 1. Furthermore, Klein, in Col. 1, lines 11-45, discloses that data can be backed-up and restored using two approaches: logical level and physical level. Therefore, there has to be a file system inherently present in the apparatus taught by the Klein reference in order to do mapping between the physical and logical levels. However, Klein does not specifically disclose about a file system that identifies files stored on the storage device and storage location information for the respective files; and performing read operations with respect to all files identified in the file system. However, Blumenau teaches that computer's OS (e.g. UNIX or DOS)

includes a file system that does mapping between the physical level and logical level (e.g. see Col. 1, lines 35-42). Blumenau further discloses that in logical to physical mapping process, the file system accesses file tables to determine where the file is actually physically located and converts a file name to a set of physical blocks. The file tables, which are stored along with actual data on the storage disk, identify, for each file name, the starting block and the number of blocks in the file (i.e. the file system identifies files stored on the storage device and storage location information for the respective files) (see Col. 3, lines 30-36). Blumenau also discloses about performing read operations with respect to all files identified in the file system (e.g. see Col. 4, lines 8-11). Accordingly, it would have been obvious to one of ordinary skill in the art at the time of the current invention was made to implement Blumenau's teachings in the apparatus taught by the combination of Klein and Polfer so valid data blocks/files can be identified for back-up purpose during the read operation.

As per claim 20, the combination of Klein, Polfer and Blumenau teaches the claimed invention as described above and furthermore, Klein teaches that the at least one of the read operations includes reading metadata (i.e. extent map info stored in 216 in Fig. 2) associated with one or more files (i.e. data blocks) on the storage device (e.g. see Col. 6, lines 45-53).

As per claims 22-24, the combination of Klein, Polfer and Blumenau teaches the claimed invention as described above. The further limitations of having, the (second) processor comprising the filter driver (i.e. the software program) and, the (second)

processor is part of a storage management system, are inherently embedded in the system taught by the combination of Klein and Blumenau.

As per claim 25, the combination of Klein and Polfer discloses the claimed invention as described above in rejection of claim 1. Furthermore, Klein, in Col. 1, lines 11-45, discloses that data can be backed-up and restored using two approaches: logical level and physical level. There has to be a file system inherently present in the apparatus taught by the Klein reference in order to do mapping between the physical and logical levels. However, Klein does not specifically disclose about identifying on the storage device at least one data block comprising file data based on information on the file system. Blumenau, on the other hand, discloses physical data blocks to be backed-up based on file system information (e.g. see Col. 6, lines 45-53). Accordingly, it would have been obvious to one of ordinary skill in the art at the time of the current invention was made to implement Blumenau's teachings in the method taught by the combination of Klein and Polfer so valid data blocks/files can be identified for back-up purpose during the read operation using the file system information.

8. Claims 3, 12 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klein in view of Polfer, further in view of Long et al. (USPN: 2003/0195865) hereinafter, Long.

As per claim 3, the combination of Klein and Polfer teaches the claimed invention as described above. However, both Klein and Polfer failed to teach that reading metadata includes reading the name of the file, access permissions to the file, the date

of creation of the file, and dates of modification of the file. Long, on the other hand, teaches that information about files is generally referred to as the file system "metadata". Examples of metadata associated with files are: (1) a document's name, creation date, last modified date (2) permissions for accessing the document, and (3) the folder path for accessing the document (e.g. see paragraph [0010]). Accordingly, it would have been obvious to one of ordinary skill in the art at the time of the current invention was made to modifying the method taught by the combination of Klein and Polfer by including the step of reading information about file, such as name, access permission, date of creation and date of modification, as taught by Long. In doing so, it can be determined which specific data block(s) are valid and based on that those data block(s) is/are replicated. Therefore, it is being advantageous.

As per claims 12 and 27, see arguments with respect to the rejection of claim 3. Claims 12 and 27 are also rejected based on the same rationale as the rejection of claim 3.

9. Claims 4-5 and 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klein in view of Polfer, further in view of Neufeld (USPN: 5,668,971).

As per claim 4, the combination of Klein and Polfer teaches the claimed invention as described above. However, both of them failed to teach the further limitation of cleaning a cache on a computer associated with the storage device before performing any read operations. Neufeld, on the other hand, teaches about cleaning/flushing the cache memory (i.e. the combination of 24 and 28 in Fig. 1) prior to performing any read

operations (e.g. see Col. 3, lines 58-65). Accordingly, it would have been obvious to one of ordinary skill in the art at the time of the current invention was made to implement the cleaning step of Neufeld in the method taught by the combination of Klein and Polfer. In doing so, it will prevent any attempts to fill (invalid) data from the cache memory in response to the read request.

As per claim 5, the combination of Klein and Polfer teaches a method for replicating data from a storage device as described above in the rejection of claim 1. However, both failed to teach the further limitation of cleaning a cache on a computer associated with the storage device before performing any read operations. Neufeld, on the other hand, teaches about cleaning/flushing the cache memory (i.e. the combination of 24 and 28 in Fig. 1) prior to performing any read operations (e.g. see Col. 3, lines 58-65). Accordingly, it would have been obvious to one of ordinary skill in the art at the time of the current invention was made to implement the cleaning step of Neufeld in the method taught by the combination of Klein and Polfer. In doing so, it will prevent any attempts to fill (invalid) data from the cache memory in response to the read request.

As per claim 15, see arguments with respect to the rejection of claim 4. Claim 15 is also rejected based on the same rationale as the rejection of claim 4.

As per claims 14 and 16-17, the combination of Klein, Polfer and Neufeld teaches the claimed invention as described above. The further limitations of having, the (first) processor residing on the computer, the (second) processor is configured to manage the storage operations of the computer, and the processor comprising the filter driver, are inherently embedded in the system taught by Klein.

10. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Klein in view of Polfer, further in view of Blumenau and Neufeld.

As per claim 19, the combination of Klein, Polfer and Blumenau teaches a method for replicating data from a storage device as described above in the rejection of claim 18. However, both of them failed to teach the further limitation of cleaning a cache on a computer associated with the storage device before performing any read operations. Neufeld, on the other hand, teaches about cleaning/flushing the cache memory (i.e. the combination of 24 and 28 in Fig. 1) prior to performing any read operations (e.g. see Col. 3, lines 58-65). Accordingly, it would have been obvious to one of ordinary skill in the art at the time of the current invention was made to implement the cleaning step of Neufeld in the method taught by the combination of Klein, Polfer and Blumenau. In doing so, it will prevent any attempts to fill (invalid) data from the cache memory in response to the read request.

11. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Klein in view of Polfer, further in view of Blumenau and Long.

As per claim 21, the combination of Klein, Polfer and Blumenau teaches the claimed invention as described above. However, both of them failed to teach that reading metadata includes reading the name of the file, access permissions to the file, the date of creation of the file, and dates of modification of the file. Long, on the other hand, teaches that information about files is generally referred to as the file system

"metadata". Examples of metadata associated with files are: (1) a document's name, creation date, last modified date (2) permissions for accessing the document, and (3) the folder path for accessing the document (e.g. see paragraph [0010]). Accordingly, it would have been obvious to one of ordinary skill in the art at the time of the current invention was made to modifying the method taught by the combination of Klein, Polfer and Blumenau by including the step of reading information about file, such as name, access permission, date of creation and date of modification, as taught by Long. In doing so, it can be determined which specific data block(s) are valid and based on that those data block(s) is/are replicated. Therefore, it is being advantageous.

12. Claims 30 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klein in view of Polfer, further in view of van Rietschote (USPN: 6,757,778) hereinafter, Rietschote, and Blumenau.

As per claims 30 and 33, the combination of Klein and Polfer teaches the claimed invention as described above. However, both of them failed to teach that the file system is associated with a virtual storage device used to manage storage of data on the storage device. Rietschote, on the other hand, teaches about associating the file system with a virtual storage device used to manage storage of data on the storage device (e.g. see the abstract). Accordingly, it would have been obvious to one of ordinary skill in the art at the time of the current invention was made to implement the teachings of Rietschote in the method and system taught by the combination of Klein and Polfer since if the storage management system supports a set of storage

commands for the virtual storage devices, the storage management system can schedule various applications/operating systems for execution on multiple processing hardware, and present a consistent view of storage for a given application/operating system, independent of which of the multiple processing hardware on which the application/operation system is executing.

However, Klein, Polfer and Rietschote failed to specifically disclose about identifying on the storage device at least one data block comprising file data based on information on the file system. Blumenau, on the other hand, discloses physical data blocks to be backed-up based on file system information (e.g. see Col. 6, lines 45-53). Accordingly, it would have been obvious to one of ordinary skill in the art at the time of the current invention was made to implement Blumenau's teachings in the method/system taught by the combination of Klein, Polfer and Rietschote so valid data blocks/files can be identified for back-up purpose during the read operation using the file system information.

13. Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Blumenau in view of Klein, further in view of Polfer.

As per claim 45, Blumenau teaches a method to replicate data stored in a storage system, comprising: examining a file system associated with the storage system, wherein the file system specifies one or more files and identifies one or more storage locations associated with at least one of the one or more files (see Col. 1, lines 35-48); identifies files and physical blocks to be backed-up (i.e. reading each file of the

file system to determine the files/blocks to be backed-up) (e.g. see Col. 6, lines 45-53). However, Blumenau does not teach about creating a list of identifier of at least one storage location accessed in association with each read operation; and after at least one read operation is performed, replicating data stored in each storage location identified in the list. Klein, on the other hand, teaches about identifying one or more data blocks (i.e. the data blocks 215 in Fig. 2) on the storage device (i.e. 200 in Fig. 2) that contain valid data (i.e. blocks which contain meaningful information; according to the spec of the current application, any data block(s) containing any kind of data in it are considered as data blocks having valid data) (e.g. see Col. 6, lines 45-50 and Fig. 2). The further step of recording is inherently taught by the Klevin because in order to determine whether the data block contains the meaningful information or not, the particular block needs to be read (i.e. I/O access by performing a read operation) first and to determine whether data exist (i.e. to identify whether it comprise the file data or not) in it or not and then each block get backed up by copying it to the storage medium 250, i.e. read, i.e. I/O access is performed (e.g. see Col. 6, lines 45-53 and Figs. 2 and 8A). Accordingly, it would have been obvious to one of ordinary skill in the art at the time of the current invention was made to implement Blumenau's teachings in the method taught by Klein so only the valid data is replicated by copying only the data blocks that were accessed during the at least one read operation. Hence, the back-up process becomes more efficient and faster.

Neither Blumenau nor Klein teaches about performing “read operation” in a "first memory location" that is different from a "second memory location" where the I/O

accesses are recorded. Polfer, on the other hand, teaches about generating block map to indicate whether each of the data blocks in the partition contain valid data (i.e. the data blocks are read from the partition that is different from the block map where the validity flags/I/O accesses are recorded) (see the abstract). Accordingly, it would have been obvious to one of ordinary skills in the art at the time of the current invention was made to record the I/O accesses in a memory location that is different from the memory location where the data blocks are read from in the method of the combination of Blumenau and Klein as taught by Polfer so a single list (i.e. the block map) of all valid data blocks of the storage device can be created and based on that the back up/replication process can be started.

Remarks

14. As to the remark, Applicant asserted that

(a) The claimed limitation, the "First" and "Second" memory locations are different, is supported by the specification on page 8, lines 7-10. Applicant equates the claimed first and second memory locations with "the storage manager 155" and "the virtual device 140". Hence, the 112 rejection is improper and should be withdrawn.

(b) Klein does not explicitly teach "performing at least one read operation with respect to the at least one data block, the at least one read operation comprising performing at least one I/O access to the at least one first memory location on the storage device" and "recording, in one or more second

memory locations different from the at least one first memory location, one or more I/0 accesses performed with respect to the storage device in association with the at least one read operation," as required by claims 1 and 10. In other words, a read operation performed with respect to the extent map itself in order to identify where data is stored would not meet the limitations of amended claims 1 and 10, which require a "read operation" in a "first memory location" that is different from the "second memory locations" where I/O accesses are recorded. If the extent map constitutes the record of I/O accesses, as the Examiner alleges, then a read operation performed on the extent map itself involves the same memory location where the extent map is stored, not a different one, as claimed.

(c) Neither Klein nor Poller teaches or suggests replicating the data blocks that contain valid data "by copying only the data blocks that were accessed during the at least one read operation," as required by amended claims 1 and 10. The Examiner has admitted that Klein does not teach or suggest the claimed "at least one read operation" at page 4 of the Office Action, and therefore cannot teach or suggest this amended limitation. Polfer does not teach or suggest this limitation, either. None of the other cited art teaches or suggests the combination of amended claims 1 and 10, either. Therefore, amended claims 1 and 10, and their respective dependent claims, are patentable over the cited art. The dependent claims include patentable limitations, as well.

Examiner respectfully traverses Applicant's remark for the following reasons:

With respect to (a), Examiner understood Applicant's point and withdrawn the 112 rejection raised in the last office action.

With respect to (b), as clearly described in the rejection above, although Klein does not teach about performing "read operation" in a "first memory location" that is different from a "second memory location" where the I/O accesses are recorded, Polfer teaches it by disclosing about generating block map to indicate whether each of the data blocks in the partition contain valid data (i.e. the data blocks are read from the partition that is different from the block map where the validity flags/I/O accesses are recorded) (see the abstract). Accordingly, it would have been obvious to one of ordinary skills in the art at the time of the current invention was made to record the I/O accesses in a memory location that is different from the memory location where the data blocks are read from in the Klein's method as taught by Polfer so a single list (i.e. the block map) of all valid data blocks of the storage device can be created and based on that the back up/replication process can be started.

With respect to (c), Examiner would like to point out to Applicant that by reciting "Klein does not teach about performing "read operation" in a "first memory location" that is different from a "second memory location" where the I/O accesses are recorded", Examine to meant to say that although Klein teaches about performing read operation and recording I/O operation on the same memory location, Klein does not teach performing "read operation" in a "first memory location" that is different from a "second memory location" where the I/O accesses are recorded. Hence, Klein does teach about

replicating the data blocks that contain valid data by copying only the data blocks that were accessed during the at least one read operation (e.g. see Col. 6, lines 45-53 and Figs. 2 and 8A).

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to HETUL PATEL whose telephone number is (571)272-4184. The examiner can normally be reached on 8:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Kim can be reached on 571-272-4182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Hetul Patel
Examiner
Art Unit 2186